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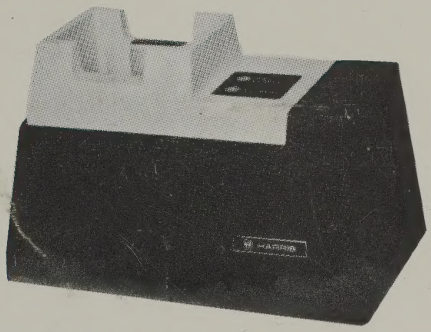
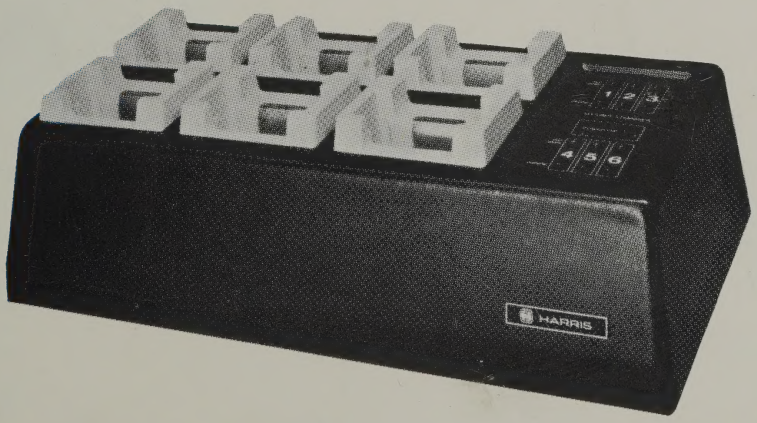
HARRIS
RF COMMUNICATIONS DIVISION

RF-7900 SERIES CHARGERS



RF-7900-1F AND RF-7901-1F SINGLE UNIT SERIES CHARGERS



RF-7900-6F AND RF-7901-6F SIX UNIT SERIES CHARGERS

Publication Date
October 22, 1984

WARRANTY

RF Communications warrants the equipment purchased hereunder to be free from defect in material and workmanship under normal use and service, when used for the purpose for which the same was designed, for a period of one year from the date of delivery, provided that notice of such defect is given to RF Communications within sixty (60) days after the discovery thereof and provided that inspection by RF Communications indicates the parts are defective to RF Communications' reasonable satisfaction. RF Communications' obligations under this warranty are limited to the repair or replacement of defective parts and the return of such repaired or replaced parts to the purchaser F.O.B. factory. At RF Communications' option, any defective part shall be returned to RF Communications' factory for inspection, properly packed and all expenses prepaid. No parts shall be returned unless the purchaser first obtains a return authorization number, which will be furnished on request. Electron tubes are warranted in accordance with the manufacturer's standard tube warranty policy, which will be furnished on request. Equipment furnished by RF Communications, but manufactured by another, bears only the warranty given by such other manufacturer, which will be furnished on request. No warranties other than those set forth in this section are given or are to be implied with respect to the equipment furnished hereunder and RF Communications shall in no event be liable for consequential damages, or for loss, damage, or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment.

CORRESPONDENCE AND PARTS ORDERING

Whenever writing about this unit or ordering parts, always refer to the model number, serial number, and date of purchase. Special parts should be ordered by the RF part number and the part's schematic reference number. Standard parts can be obtained from your local parts distributor.

ACCESSORIES

From time to time, new accessories are added to our product line. Often, these are a result of particular customer needs. Our sales department will be happy to discuss your requirements and suggest possible solutions.

SPECIFICATIONS

Primary Power Source:	115/230 Vac, ±20%, 50/60 Hz	
Fast Charging Current:	RF-7900	225 mA ±15% at 25°C
	RF-7901	450 mA ±15% at 25°C
Trickle Charging Current:	RF-7900	22.5 mA at 25°C Adjustable
	RF-7901	45 mA at 25°C Adjustable
Charging Time:		
For Fast Charge Batteries		
■ **1 Hour Normal**	80% of Charge	
■ **7 – 8 Hours**	Full Charge	
For Standard Charge Batteries		
■ **14 – 16 Hours**		
Temperature Range:		
Fast-Charge Operation	+15 to 35°C (switches to trickle charge above 35°C)	
Trickle Charge	+5 to +50°C	

SECTION 1
GENERAL INFORMATION

1.0 INTRODUCTION

This manual contains setup, operation, and service information for Harris RF-7900 Series chargers. These chargers are designed specifically to charge RF-2800 and RF-7800 Series portable radios and their respective nickle-cadmium batteries.

1.1 GENERAL DESCRIPTION

RF-7900 Series chargers are listed in Table 1-2. All models operate from 115/230 Vac, 50/60 Hz primary power. The RF-7900-1F and -6F models are used for charging "thinline" radios and the RF-7901-1F and -6F models are used for charging "multiline" radios. RF-2800 and RF-7800 Series radios can be identified as "thinline" or "multiline", by the 3rd digit in the RF number. A "1" identifies the unit as thinline, and a "2", "4", or "5" identifies the unit as a multiline. As an example, RF-2810 and RF-7810 radios are thinline, and RF-2820, RF-2840, RF-2854, RF-7820, RF-7840, and RF-7854 are multiline radios. The RF-7900-1F and RF-7901-1F accommodate single radio units while the RF-7900-6F and RF-7901-6F can charge up to six units simultaneously. Single and six-unit chargers are functionally identical, and will automatically sense when fast-charge type batteries with integral thermistors are installed, and automatically condition themselves for fast charge. Similarly, installing standard batteries will automatically condition them for trickle charge rate. See Table 1-1.

1.2 INDICATORS

Light Emitting Diodes (LED) indicators provide visual display of battery charging status (fast-charge or trickle charge). On single unit models, fast-charge is indicated by illumination of both the yellow and green LED indicators as the battery is installed in the cavity. The yellow LED will turn off when the charge rate automatically switches to trickle. The unit will maintain a trickle rate (green indicator illuminated) until the battery or radio containing the battery is removed. Six-unit models also include a red POWER ON indicator.

1.3 115/230 VAC SELECTION

Position S1 on the main PWB to either 115 or 230 Vac, as appropriate, to agree with the primary power source voltage.

CAUTION

Do not switch with power ON.

1.4 BATTERY/RADIO CHARGE GUIDE

Table 1-1 is a Battery/Radio Charge Guide for RF-7900 Series chargers.

Table 1-1. Battery/Radio Charge Guide for RF-7900 Series Chargers

Application	Battery Type	Charger Provides
2800 Series Portables	RF-2861/2863 Batteries (Black)	Trickle Charge
	RF-2898/2899 Batteries (Yellow)	Trickle Charge
	RF-2864 IS Batteries (Green)	Trickle Charge
7800 Series Portables	RF-2861/2863 Batteries (Black)	Trickle Charge
	RF-2898/2899 Batteries (Yellow)	Fast/Trickle
	RF-2864 IS Batteries (Green)	Fast/Trickle Charge
Batteries Alone	RF-2861/2863 Batteries (Black)	Trickle Charge
	RF-2898/2899 Batteries (Yellow)	Fast/Trickle Charge
	RF-2864 IS Batteries (Green)	Fast/Trickle Charge

1.5 RF-7900 SERIES APPLICATIONS

Table 1-2 demonstrates charger model to battery/radio compatibility relationships.

Table 1-2. RF-7900 Series Chargers

Charger Model No.	Type Porta Phone	For Battery Models
RF-7900-1F	Thin Line	RF-2861 RF-2898
RF-7901-1F	Multiline	RF-2863 RF-2899 RF-2864
RF-7900-6F	Thin Line	RF-2861 RF-2898
RF-7901-6F	Multiline	RF-2863 RF-2899 RF-2864

SECTION 2
OPERATION

2.0 GENERAL

This chapter provides operating instructions for Harris RF-7900 Series Chargers.

2.1 OPERATING INSTRUCTIONS

The following procedure can be used for all RF-7900 Series chargers, and applies to the batteries and radios indicated in Tables 1-1 and 1-2.

- Verify radio OFF before installing in charger.
- Insert radio into cavity with the speaker facing toward the front of the charger. When charging a battery only, insert the battery in the cavity as illustrated on the battery label. The CHARGING (green) indicator will light. If the battery is a fast-charge type, the FAST-CHARGE (yellow) indicator will also light. At ambient temperature above 35°C, charger will automatically revert to trickle charge to protect battery.
- The fast-charge cycle will complete in approximately one hour. The FAST-CHARGE (yellow) indicator will be extinguished, but the CHARGING (green) indicator will remain on.
- The battery (or radio with a battery) may be left in the charger until ready to return to service. The CHARGING (green) indicator will extinguish when the battery, or radio with a battery, is removed from the charger.
- Minimum charging time for the fast-charge batteries to **full** charge is approximately 7 – 8 hours. Minimum charging time for trickle charge batteries to full charge is approximately 14 – 16 hours.

CAUTION

Always use the correct charger for the job. (Refer to Table 1-2). **Do Not** *attempt to charge a thinline (T/L) battery or radio in a multiline (M/L) charger. Such operation could result in damage to the radio and/or battery.*

SECTION 3

THEORY OF OPERATION

3.0 GENERAL

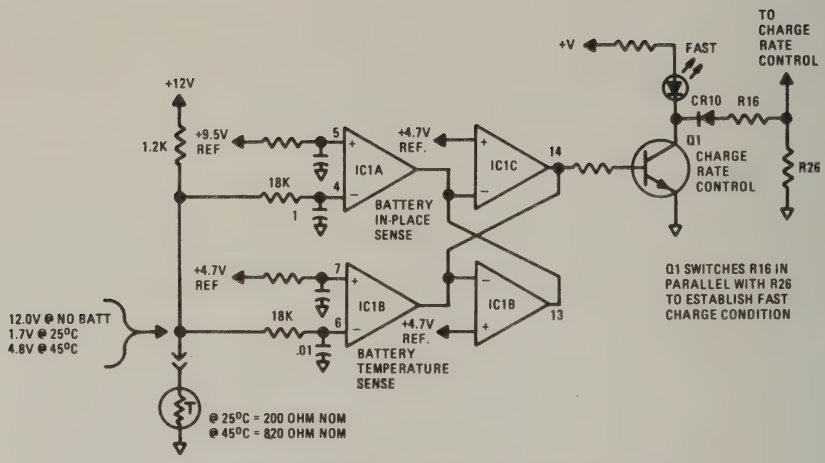
RF-7900 Series chargers incorporate several specialized circuit functions to automatically sense battery presence, battery charge rate, battery temperature, battery type, and to automatically adjust charge conditions to safely complete the charge cycle. Charge circuits are identical in both the single and 6-unit chargers, and as a consequence, one description of circuit operation applies to both units. There are two minor circuit differences in external support circuits. Refer to the schematic diagrams for each unit at the end of this manual and note that the single unit charger uses a center-tapped transformer. This feature is used to satisfy the reduced B+ requirements for LED drivers. In the 6-unit version, a separate regulator is used to satisfy this approximately 11 Vdc requirement. Similarly, IC41 and IC42 have been added in the 6-unit version to provide regulated reference voltages under the varying load conditions typical for these units.

3.1 SENSE CIRCUITS

RF-7900 Series charging rates are based on charge acceptance, voltage, cell pressure and cell temperature for the nickel-cadmium batteries they will be charging. An internal thermistor has been added to fast-charge batteries for cell temperature sensing during recharge. The internally mounted thermistor shown in Figure 3-1 changes resistance to senses any temperature change in the battery. When the battery's temperature reaches 35^{o}C, the charger switches to the trickle current and remains there indefinitely. Normally, 80% of the energy is returned to a fast-charge battery at the end of the fast-charge cycle.

3.1.1 Initial Power On

At power ON, the latch circuit shown in Figure 4-1 must be conditioned to the desired start state. This is accomplished automatically as follows. With no fast-charge battery installed at power ON, IC1B-6 rises to approximately +12 Vdc (supply voltage). This high at IC1B-6, the inverting input, is relatively higher than the fixed reference at the non-inverting IC1B-7 input, and forces a low at the output to guarantee a Q1 Charge Rate Control OFF condition (this circuit will be discussed later).



CONDITION	IC1 OUTPUTS A	B	C	D	Q1	CHARGE CONDITION	NOTES
1 INITIAL POWER ON	1	0	0	1	OFF	TRICKLE	CONTROL CKT START CONDITION ESTABLISHED
2 INSTALL FAST CHARGE BATTERY	0	1	1	0	ON	FAST	IC1B-6 GOES LOW (LESS THAN IC1B-7 REF)
3 CHARGED – THERMISTOR @45°, IC1B-6 AT 4.8V	1	0	0	1	OFF	TRICKLE	IC1B-6 GOES HIGHER THAN IC1B-7
4 LATCHED UNTIL BATTERY REMOVED	1	0	0	1	OFF	TRICKLE	C2/R6 TC HOLDS LATCH UNTIL BATTERY REMOVED

Figure 3-1. Simplified Sense and Latch Circuit

3.1.2 Fast Charge Battery Sense

When a fast-charge type battery (which includes a thermistor as shown) is installed, the voltage at IC1B-6 will drop to approximately 1.7 Vdc because of the voltage divider effect of the 200 ohm (@ 25°C) thermistor in series with the 1.2K resistor connected to the +12 Vdc source. With IC1B-6 relatively lower than IC1B-7, the IC1B output goes high to force charge rate control transistor Q1 ON.

3.1.3 Charge Sense

The relatively high fast-charge rate causes heating of the nickle-cadmium battery being charged, and a proportional increase in thermistor temperature and resistance. When the point is reached where the potential at IC1B-6 becomes sufficiently greater than the IC1B-7 reference potential, the IC1B output will go high and latch the control circuit in the Trickle Charge-Rate mode. The circuit for the battery in question will remain latched until the battery is removed during the fast charge cycle. The circuit is protected against accidentally reverting the trickle charge mode by a mechanical disturbance that coule momentarily break the spring contact connection to the thermistor. This protection is afforded by the 1 MFD/18K time constant at IC1A-4. This time constant is short enough, however, so that physically removing the battery for any period of time would guarantee reset to the fast charge mode when another discharged battery is installed.

3.2 CHARGE RATE CONTROL

Note

Reference designators shown in parenthesis are for 6-Unit Models.

Charge rate is established by R20 (XR14) which works with R22 (XR16) and R26 (XR17) in the trickle charge mode to establish the charge rate control potential at the base of series pass element Q3. Note that Q3 is mounted on the chassis for heat-sink considerations because of the charging current it must control. R20 (XR14) is adjusted to produce charge rates as follows. (Adjusting trickle charge rate also establishes fast charge rate):

	Multiline	Thinline
Trickle	45mA	25mA
Fast	450mA	250mA

Setup adjustments are made in the trickle mode as described in the maintenance section. When Q1 is switched on by a high at IC1B, R16 (XR12) is placed in parallel with R26 (XR17) to lower the bias at Q3 and increase charging current to the fast rate.

3.3 CHARGE INDICATOR

LED's show condition or mode only, and do not necessarily indicate that current is being delivered. Q4 will come on whenever a battery is installed. Q2 functions to protect the system if a defective battery is installed. If TP3

volts start to fall below 10V, Q2 would start to reduce the current to Q3 to prevent trying to charge a bad battery. If a fast charge battery should remain in the fast charge mode for a period of significantly more than 1 hour – it is time to suspect the battery. Good batteries will typically be in the range of 12 to 18 Vdc (measured TP3 to ground) when placed on the charger.

3.4 POWER SUPPLY

Power supplies in all models function to generate two dc output voltages from the 115/230 Vac input. In single-unit models the T1 center tap is used to pick-off half of the T1 secondary voltage to satisfy the display source voltage requirements. This unfiltered voltage is typically 14 – 22V peak, or 10 – 15V average. Because it is unfiltered, a digital voltmeter should not be used to measure this voltage. The voltage at TP4 will typically be 28 – 42V peak, or 20 – 30V average, and is also unfiltered dc.

6-unit models do not use a center-tapped power transformer, and as a consequence, a separate regulator circuit is used to produce the nominal 11 Vdc indicator voltage. Also, because of the varying load requirements in 6-unit models, reference voltages are derived by using two separate integrated circuit regulators: IC41 drives the +5 Vdc reference buss, and IC42 drives the +8 Vdc reference buss.

CHAPTER 4
MAINTENANCE

4.0 GENERAL

An internal switch (S1) allows service from either 115 or 230 Vac. The charger cover must be removed to set this switch to the desired voltage position. Do not change switch position with primary power applied.

CAUTION

Do not change switch position with primary power applied.

4.1 CHARGER COVER REMOVAL

CAUTION

Hazardous voltages. Disconnect power supply cord before removing cover. Servicing should be done only by qualified personnel.

4.1.1 Single Unit Charger Cover Removal

Unscrew the single screw from the bottom of the unit. Remove the two screws from the rear and carefully lift the cover from the chassis. The 115/230 Vac switch (S1), mounted on the PWB, is located next to the power transformer. (See Figure 4-1).

4.1.2 Six Unit Charger Cover Removal

Unscrew the three screws from the rear of the charger. Remove the two screws from the front of the charger and carefully lift the cover from the chassis. The 115/230 Vac switch (S1) is located directly beneath the No. 3 cavity. (See Figure 4-2.)

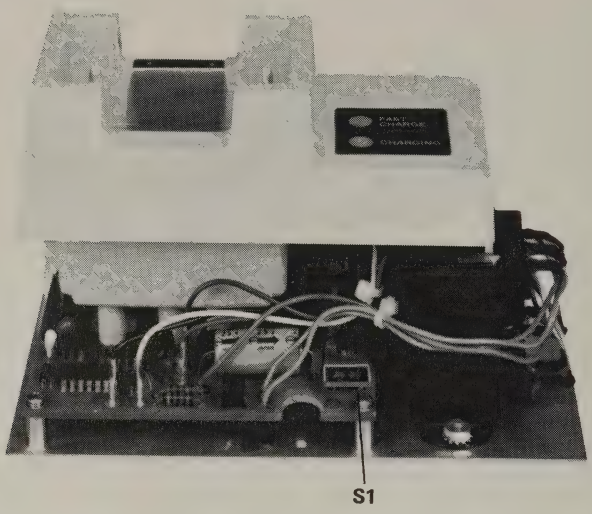


Figure 4-1. RF-7900 Series Single Unit Charger with Cover Removed

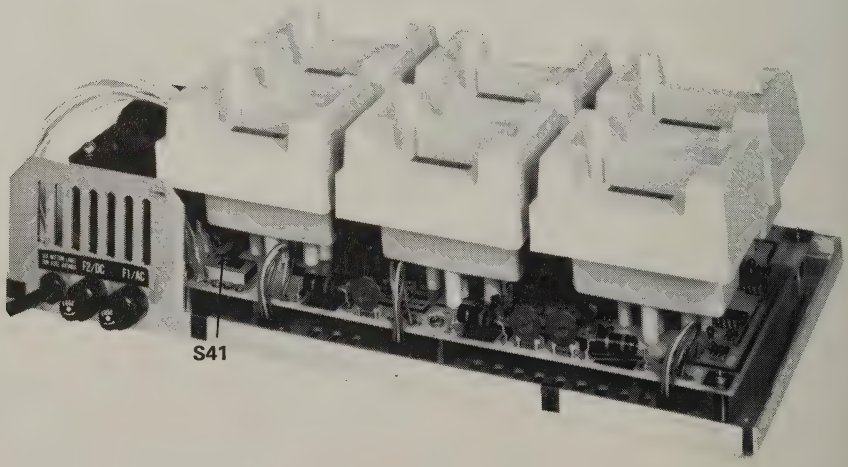


Figure 4-2. RF-7900 Series Six Unit Charger with Cover Removed

4.3 ADJUSTMENTS

Trickle charge rate is the only adjustment in the RF-7900 Series chargers. In six-unit models, a separate rate adjustment must be made for each unit (1R14, 2R14 etc.). Adjusting the trickle charge rate automatically establishes a ratio that determines the fast charge rate. Measure the battery terminal voltage before installing for this initial setup adjustment.

Note

This adjustment has been made at the factory as part of final test prior to shipment. It should not be necessary to repeat this adjustment unless the control potentiometer is disturbed or unless related circuit components are changed.

4.3.1 RF-7900 Series Single Unit Trickle Charge Adjustment

a. Remove the charger cover as described in paragraph 4.1.

b. Plug the power cord into the ac main.

c. Refer to Table 4-1 and adjust variable resistor R20 to the proper trickle rate while monitoring Test Points 4 and 5 for proper voltage, using a VOM (Bolt Ohm Meter).

Table 4-1. Trickle Rate/Charge Current Level

Battery Voltage	Test Point Voltage		Trickle Rate	
	Thinline	Multiline	Thinline	Multiline
12V	0.30V	0.32V	25mA	53mA
13V	0.29V	0.31V	24.5mA	51mA
14V	0.29V	0.29V	24mA	49mA
15V	0.28V	0.28V	23mA	46mA
16V	0.27V	0.27V	22.5mA	45mA
17V	0.25V	0.25V	21mA	42mA
18V	0.24V	0.24V	20mA	39mA
19V	0.22V	0.22V	18mA	36mA
20V	0.19V	0.19V	16mA	32mA
21V	0.18V	0.18V	15mA	30mA
22V	0.17V	0.17V	14mA	28mA

4.3.2 RF-7900 Six Unit Trickle Charge Adjustment

a. Remove charger cover as described at the beginning of this chapter.

b. Plug the power cord into the ac main.

c. Refer to Table 4-1 and adjust variable resistor (X) R14 for each of the six charging circuits to the proper trickle rate while monitoring Test Points 4 and 5 for proper voltage using a voltmeter.

Note

The TP4 and TP5 potential is unfiltered pulsating dc, and could introduce error if a digital voltmeter were used. Also, if high or low line voltages are typical, adjustment should be made at these levels.

4.4 GENERAL MAINTENANCE

If charger fails to operate, remove unit and inspect battery contacts before troubleshooting further. If contacts are clean, charger operation can be verified by placing a resistor in series with a milliammeter across the charger contacts to check the current output. (Use a 330 ohm, 1 watt resistor for multiline (M/L) chargers and a 560 ohm, 1 watt resistor for thinline (T/L) chargers.)

4.4.1 Fast Charge Levels

Fast-charge current for the RF-7900 Series chargers is:

Thinline	225 mA
Multiline	450 mA

4.4.2 Trickle Charge Levels

Trickle charge current for the RF-7900 Series chargers is:

Thinline	22.5 mA
Multiline	45 mA

4.4.3 Fuse Information

Tables 4-2 and 4-3 provide fuse requirement information for the RF-7900 Series chargers.

Table 4-2. Power/Fuse Requirements for Single Unit Chargers

Single Unit Charger	Power	Fuse "Slo Blo"	
		115 Vac	230 Vac
RF-7900-1	10W	1/8A	1/16A
RF-7901-1	20W	1/4A	1/8A

Table 4-3. Power/Fuse Requirements for Six Unit Chargers

Six Unit Charger	Power	Fuse "Slo Blo"		Fuse "Quick Acting"
		115 Vac	230 Vac	DC
RF-7900-6	50W	1A	1/2A	3A
RF-7901-6	75W	1.5A	3/4A	4A

4.4.4 Supplementary Information

Figure 4-3 provides supplementary information on the MC 3302 Quad Comparator used in the sensing circuit.

4.5 BATTERY CARE

The normal rated life of a nickel-cadmium battery is 1000 charge and discharge cycles. Nickel-cadmium batteries have a relatively short charge-state shelf-life (i.e., a fully charged nickel-cadmium battery not being used will lose one-half of its charge in about 90 days). Batteries which have been fully or severely discharged, or have been stored unused for extended periods of time (1 year or more) should be charged very slowly (trickle charge). Do not attempt to fast charge a fast-charge battery which has been unused until at least three recharge cycles have been provided on a trickle charge current. The thermistor terminal of the fast-charge battery must first be covered with cellophane tape before being placed in the RF-7900 charger. The thermistor terminals on a fast-charge battery are located on the bottom and on the back of the battery and are unlabeled. The other two terminals on the bottom and back are labeled (+) and (–). The thermistor terminal on the bottom of the 7800 Series Porta-Phone radios is labeled (S). The (+) and (–) terminals are also labeled.

Always observe the following general battery care precautions:

- Avoid frequent complete discharge of nickel-cadmium batteries.
- Batteries should be left on trickle charge when not in use.

MC3302P

Quad Single-Supply Comparator

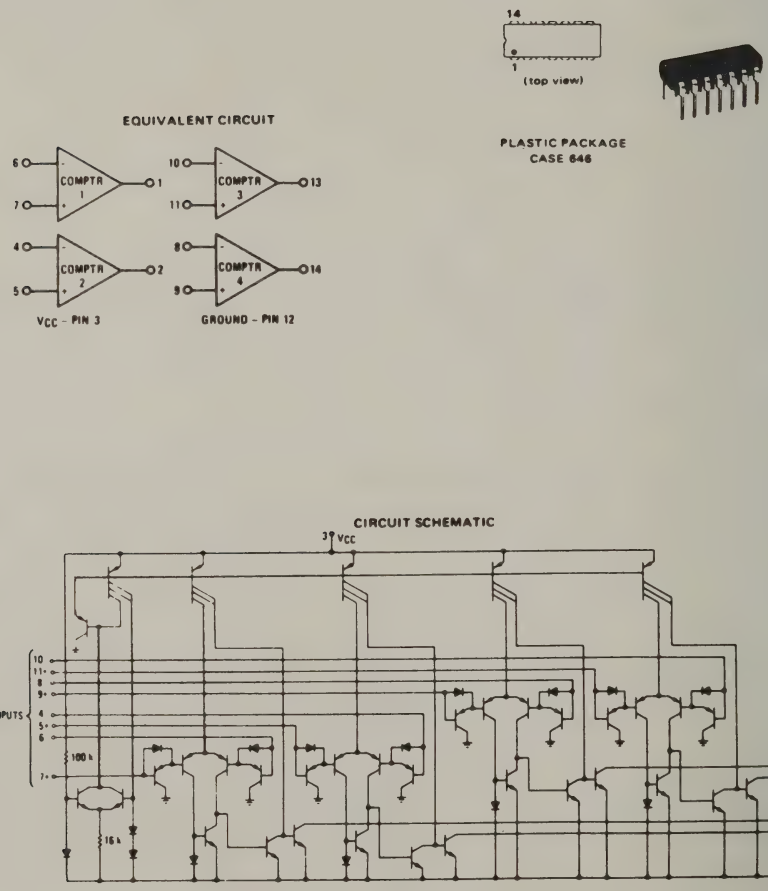


Figure 4-3. Supplementary MC3302 Information

SECTION 5
PARTS LISTS AND DRAWINGS

5.0 GENERAL

This section contains all RF-7900 Series parts lists, and drawings.

5.1 PARTS LIST

Table 5-1 lists Single Unit Charger Series parts list. This list is the same for thinline and multiline series with exceptions noted. Table 5-2 lists 6-Unit Charger Series parts lists. This list is the same for thinline and multiline series with exceptions noted.

5.2 COMPONENT LOCATION DRAWINGS

Single unit component locations are on Figure 5-1. 6-Unit component locations are shown on Figure 5-2.

5.3 SCHEMATICS

Figure 5-1 gives single unit schematic information. Figure 5-3 gives 6-unit schematic information.

Table 5-1. Single Unit Charger Parts List

RF-7900-1F and RF-7901-1F			
REF. DESIG.	NAME OF PART AND DESCRIPTION	PART NO.	MFR CODE
RF-7900-1F	Single Unit Charger, Thinline	6631-5018	14304
RF-7901-1F	Single Unit Charger, Multiline	6631-5020	14304
C1	Capacitor, Electrolytic, 470 uF, 25V	C1419	14304
C2	Capacitor, Tantalum, 1 uF	C6442	14304
C3, C4	Capacitor, Ceramic, 0.01 uF, 50V	C4952	14304
C5	Capacitor, Tantalum, 4.7 uF, 20V	C6446	14304
C6	Capacitor, Tantalum, 15 uF, 20V	C6449	14304
C7	Capacitor, Tantalum, 4.7 uF, 20V	C6446	14304
CR1	Diode, Bridge, VM08	IC0426	14304
CR2	Diode, Zener, 1N4742	CR0606	14304
CR3	Diode, LED, Yellow, Fast	6631-5013	14304
CR4, CR5	Diode, 1N4454	CR0705	14304
CR6	Diode, Zener 1N5232B	CR0265	14304
CR8	Diode, 1N4004	CR0725	14304
CR9	Diode, LED, Green, Charging	6631-5012	14304
CR10	Diode, 1N4454	CR0705	14304
F1	**Fuse, Slo Blo, 1/8A (115V)**	**F03-0003-002**	14304
	Fuse, Slo Blo, 1/4A (115V)	**F00031**	14304
	Fuse, Slo Blo, 1/8A (230V)	**F03-0003-002**	14304
	Fuse, Slo Blo, 3/16A (230V)	**F03-0003-001**	14304
IC1	IC, Quad Comparator, LM3302	I20-0001-000	14304
Q1	Transistor, 2N4124	Q0385	14304
Q2	Transistor, 2N4409	Q15-0001-000	14304
Q3	Transistor, 2N6035	Q02-6035-000	14304
Q4	Transistor, MPS-A64	Q0410	14304
R1	Resistor, 1200 ohm, 1/4W 5%	R1251	14304
R2	Resistor, 10K, 1/4W 5%	R1273	14304
R3 to R8	Resistor, 18K, 1/4W 5%	R1279	14304
R9, R10	Resistor, 100K ohm, 1/4W, 5%	R1297	14304
R11	Resistor, 18K, 1/4W 5%	R1297	14304
R12	Resistor, 470 ohm, 2W 5%	R1641	14304
R13, R14	Resistor, 4.7K, 1/4W 5%	R1265	14304
R15	Resistor, 470 ohm, 1/2W 5%	R1441	14304
R16	Resistor, 1000 ohm, 1/4W 5%	R1249	14304
R17	Resistor, 18K, 1/4W 5%	R1279	14304
R18	Resistor, 33 K, 1/4W 5%	R1213	14304

Table 5-1. Single Unit Charger Parts List (Continued)

RF-7900-1F and RF-7901-1F			
REF. DESIG.	NAME OF PART AND DESCRIPTION	PART NO.	MFR CODE
R20	Resistor, 2K Potentiometer	R1181	14304
R22	Resistor, 330 ohm, 1/4W 5%	R1237	14304
R23, R24	Resistor, 12 ohm, 2W 5%	R1803	14304
R26	Resistor, 8.2K ohm, 1/4W 5%	R1271	14304
R27	Resistor, 18K ohm, 1/4W 5%	R1279	14304
R28	Resistor, 330 ohm, 1/2W 5%	R1437	14304
R29	Resistor, 18K ohm, 1/4W 5%	R1279	14304
S1	Switch, 115/230V	S30-0001-000	14304
T1	Transformer, Power	T40-0002-000	14304
X1	Cover	E6631-5027	14304
X2	Cavity Assembly, Thinline	C6631-5009	14304
X3	Cavity Assembly, Multiline	C6631-5010	14304

Table 5-2. 6-Unit Charger Parts List

RF-7900-6F and RF-7901-6F			
REF. DESIG.	NAME OF PART AND DESCRIPTION	PART NO.	MFR CODE
RF-7900-6F	6-Unit Charger Thinline	6631-5311	14304
RF-7901-6F	6-Unit Charger, Multiline	6631-5313	14304
A1	Display PWB Assembly	6631-5139/5140	14304
A1CR1	LED, Green	N20-0003-001	14304
A1CR2	LED, Yellow	N20-0003-002	14304
A1CR3	Same as CR1		
A1CR4	Same as CR2		
A1CR5	Same as CR1		
A1CR6	Same as CR2		
A1CR7	Same as CR1		
A1CR8	Same as CR2		
A1CR9	Same as CR1		
A1CR10	Same as CR2		
A1CR11	Same as CR1		
A1CR12	Same as CR2		
A1CR13	LED, Red	N20-0003-003	14304
A1J1	Connector, 16 pin, Right Angle	J43-0001-010	14304
A1R1 to R6	Resistor, 470 ohm, 1/2W 5%	R1441	14304
A1R7	Resistor, 470 ohm, 1W 5%	R1641	14304
A1R8	Resistor, 50 ohm, 5W Wire Wound	R3812	14304
A2	Main PWB Assembly	6631-5117/5120	
	Note Components identified with an (X) prefix are used six times, one for Unit 1 (ex IC1) ... thru Unit 6 (ex IC6)		
A2(X)C1	Capacitor, Tantalum, 1 uF	C6442	14304
A2(X)C2	Capacitor, Tantalum, 15 uF	C6449	14304
A2(X)C3	Capacitor, Ceramic, 0.01 uF	C4952	14304
A2(X)C4	Same as (X)C3		
A2(X)C5	Capacitor, Tantalum, 4.7 uF	C6446	14304
A2C41, C42	Same as (X)C5		
A2C43	Capacitor, Electrolytic, 500 uF	C20-0015-501	14304
A2C44	Capacitor, Tantalum, 4.7 uF	C6446	14304
A2C45	Capacitor, Tantalum, 15 uF	C6449	14304
A2(X)CR3	Diode, 1N4454	CR0705	14304
A2(X)CR4	Same as (X)CR3		
A2(X)CR5	Diode, 2N5232	CR0265	14304

Table 5-2. 6-Unit Charger Parts List (Continued)

RF-7900-6F and RF-7901-6F

REF. DESIG.	NAME OF PART AND DESCRIPTION	PART NO.	MFR CODE
A2(X)CR6	Diode, 1N4454	CR0705	14304
A2(X)CR7	Diode, 1N4004	CR0725	14304
A2(X)CR42	Diode, MR751	CR0407	14304
A2CR43	Diode, 1N4742	CR0606	14304
A2E1 to E10	Terminal	J03-0002-000	14304
A2(X)IC1	IC, Quad Comparator	I20-0001-000	14304
A2IC41	IC, Regulator, 78L05	I12-0006-005	14304
A2IC42	IC, Regulator, 78L08	I12-0006-008	14304
A2J1	Connector, PCB Mating	J41-0002-016	14304
A2(X)Q1	Transistor, 2N4124	Q0385	14304
A2(X)Q2	Transistor, 2N4409	Q15-0001-000	14304
A2(X)Q3	Transistor, 2N6035	Q02-6035-000	14304
A2(X)Q4	Transistor, MPS-A64	Q0410	14304
A2Q41	Transistor, 2N5190	Q0416	14304
A2(X)R1	Resistor, 1K ohm, 1/4W 5%	R1249	14304
A2(X)R2	Resistor, 18K ohm, 1/4W 5%	R1279	14304
A2(X)R3	Same as (X)R2		
A2(X)R4	Resistor, 4.7K ohm, 1/4W 5%	R1265	14304
A2(X)R5	Resistor, 18K ohm, 1/4W 5%	R1279	14304
A2(X)R6	Resistor, 100K ohm, 1/4W 5%	R1297	14304
A2(X)R7	Resistor, 100K ohm, 1/4W 5%	R1297	14304
A2(X)R8	Resistor, 18K ohm, 1/4W 5%	R1279	14304
A2(X)R9	Resistor, 4.7K ohm, 1/4W 5%	R1265	14304
A2(X)R10	Same as (X)R9		
A2(X)R12	Resistor, 1K ohm, 1/4W 5%	R1249	14304
A2(X)R13	Resistor, 18K ohm, 1/4W 5%	R1279	14304
A2(X)R14	Resistor, Variable, 2K ohm	R1181	14304
A2(X)R15	Resistor, 33K ohm, 1/4W 5%	R1285	14304
A2(X)R16	Resistor, 330 ohm, 1/4W 5%	R1237	14304
A2(X)R17	Resistor, 8.2K ohm, 1/4W 5%	R1271	14304
A2(X)R18	Resistor, 18K ohm, 1/4W 5%	R1279	14304
A2(X)R19	Resistor, 12 ohm, 2W 5%	R1803	14304
A2(X)R20	Same as (X)R19 (Multiline Only)		
A2(X)R21	Resistor, 18K ohm, 1/4W 5%	R1279	14304
A2(X)R23	Resistor, 470 ohm, 1/2W 5%	R1441	14304
A2R42	Resistor, 33 ohm, 2W 5%	R1813	14304

Table 5-2. 6-Unit Charger Parts List (Continued)

RF-7900-6F and RF-7901-6F

REF. DESIG.	NAME OF PART AND DESCRIPTION	PART NO.	MFR CODE
A2R43	Resistor, 560 ohm, 1W 5%	R1643	14304
A2R44	Resistor, 33 ohm, 2W 5%	R1813	14304
A2S41	Switch, 115/230V	S30-0001-000	14304
CR41	Rectifier, Bridge	D22-5004-00	14304
F41	Fuse, 1.5A Slo Blo, 115 Vac	F0030	14304
F41	Fuse, 1/2A Slo Blo, 115 Vac	F0032	14304
F41	Fuse, 1/4A Slo Blo, 230 Vac	F03-0003-006	14304
F41	Fuse 3/4A Slo Blo, 230 Vac	F03-0003-010	14304
F42	Fuse, 3/4 Amp DC	F0009	14304
F42	Fuse, 3.0 Amp DC	F0013	14304
F42	Fuse, 4.0A DC	F0014	14304
T41	Transformer, Power	6631-5182	14304
XF41/XF42	Fuseholder, 3AG	F01-0003-202	14304
	Cover, 6-Unit Charger	6631-5127	14304
	Rubber Feet	Z17-0004-000	14304
	Contact, Battery	B6631-5054	14304
	Spring Contact	B6631-5057	14304
	Cavity Assembly, Thinline	6631-5109	14304
	Cavity Assembly, Multiline	6631-5110	14304
	Line Cord Assembly	6631-5133	14304

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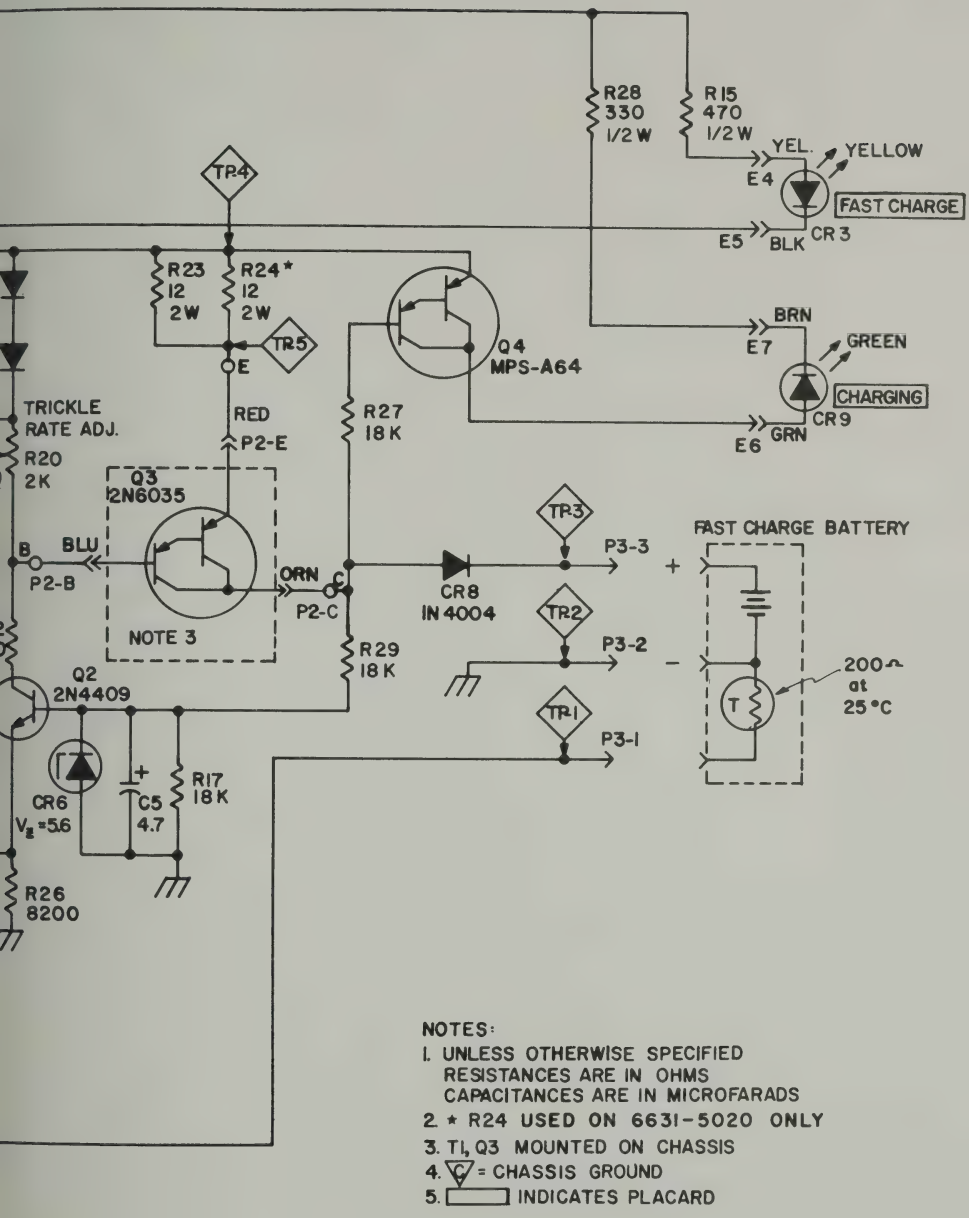
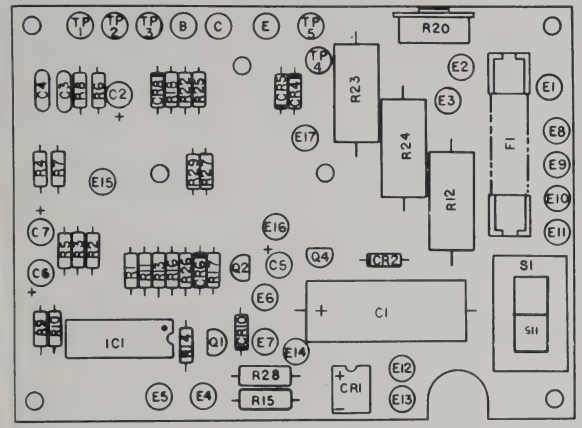


NOTES:

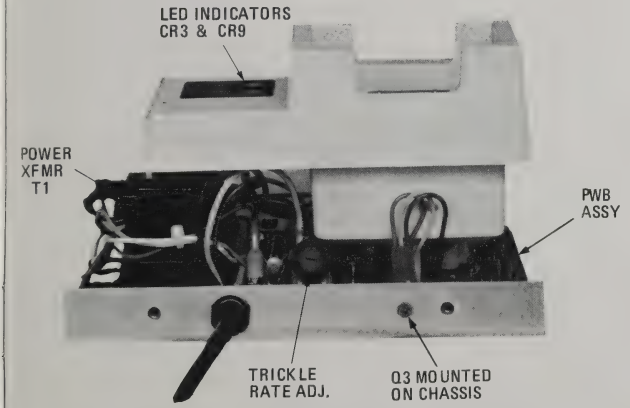
1. UNLESS OTHERWISE SPECIFIED RESISTANCES ARE IN OHMS CAPACITANCES ARE IN MICROFARADS
2. * R24 USED ON 6631-5020 ONLY
3. T1, Q3 MOUNTED ON CHASSIS
4. ▽ = CHASSIS GROUND
5. ▭ INDICATES PLACARD

Figure 5-1. Single Unit Series Charger Schematic RF-7900-1F and RF-7901-1F

NOTES:



Single Unit Series PWB



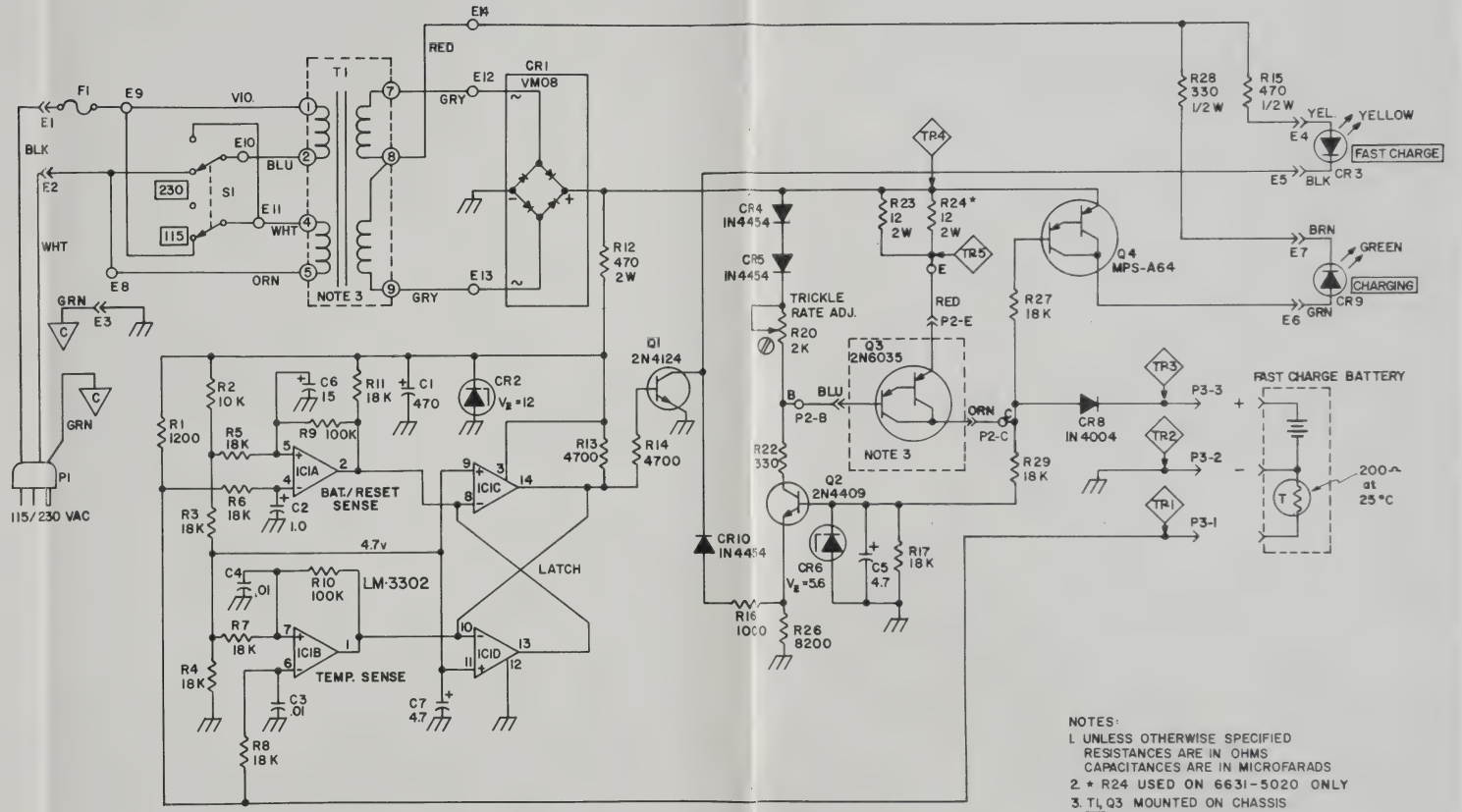


Figure 5-1. Single Unit Series Charger Schematic RF-7900-1F and RF-7901-1F

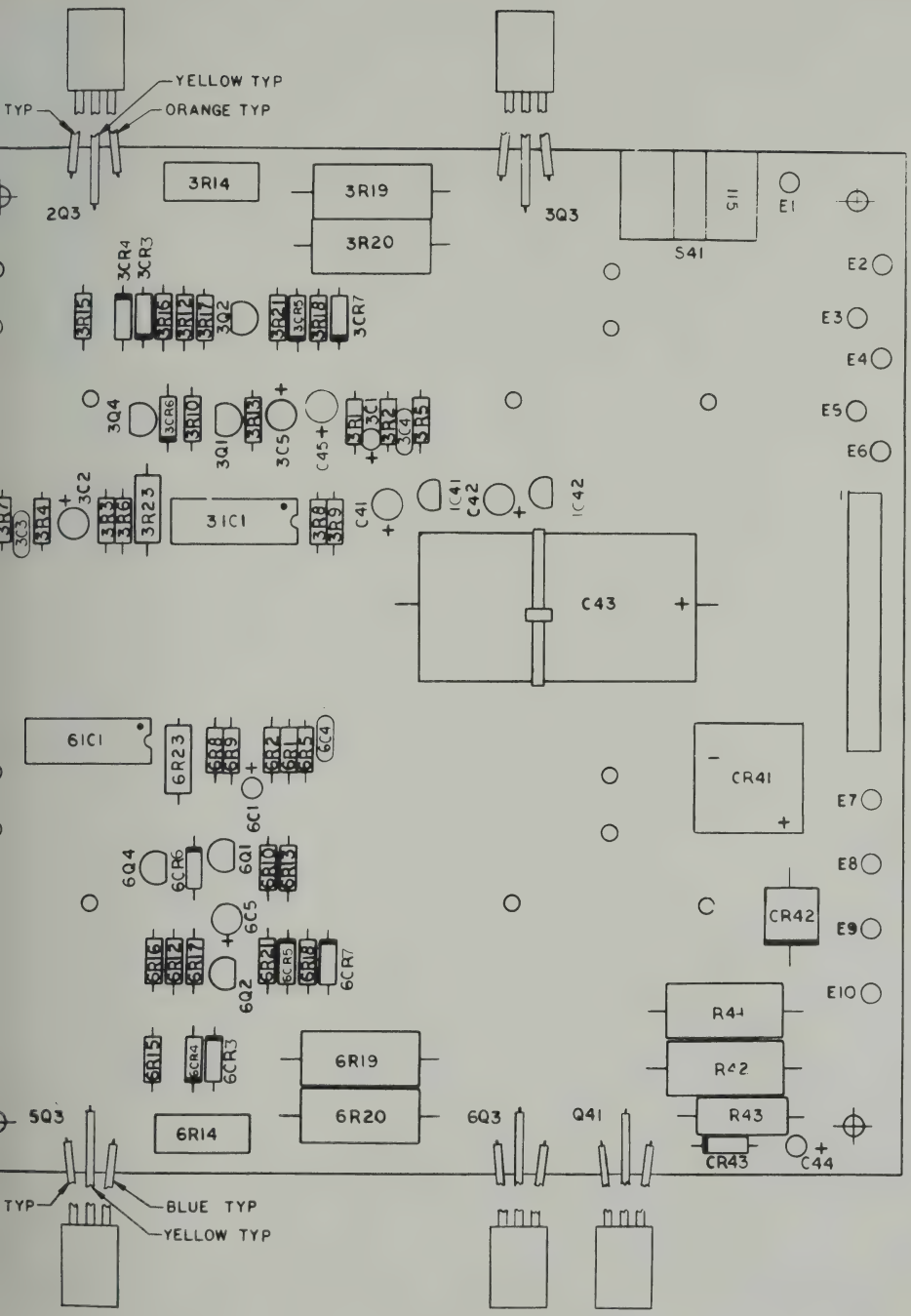
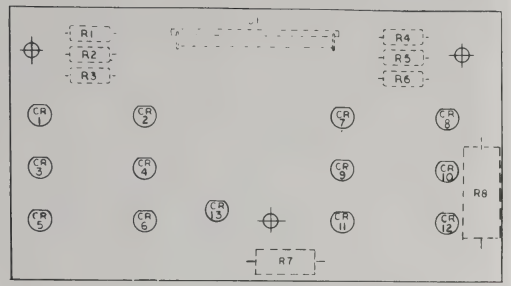
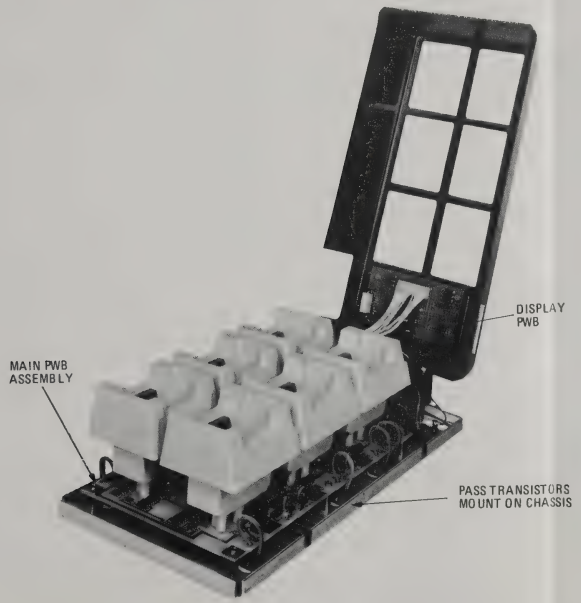


Figure 5-2. 6-Unit Series Charger Main PWB Assembly RF-7900-6F and RF-7901-6F



DISPLAY PWB SIX-UNIT CHARGER ASSY
B6631-5139-/5140



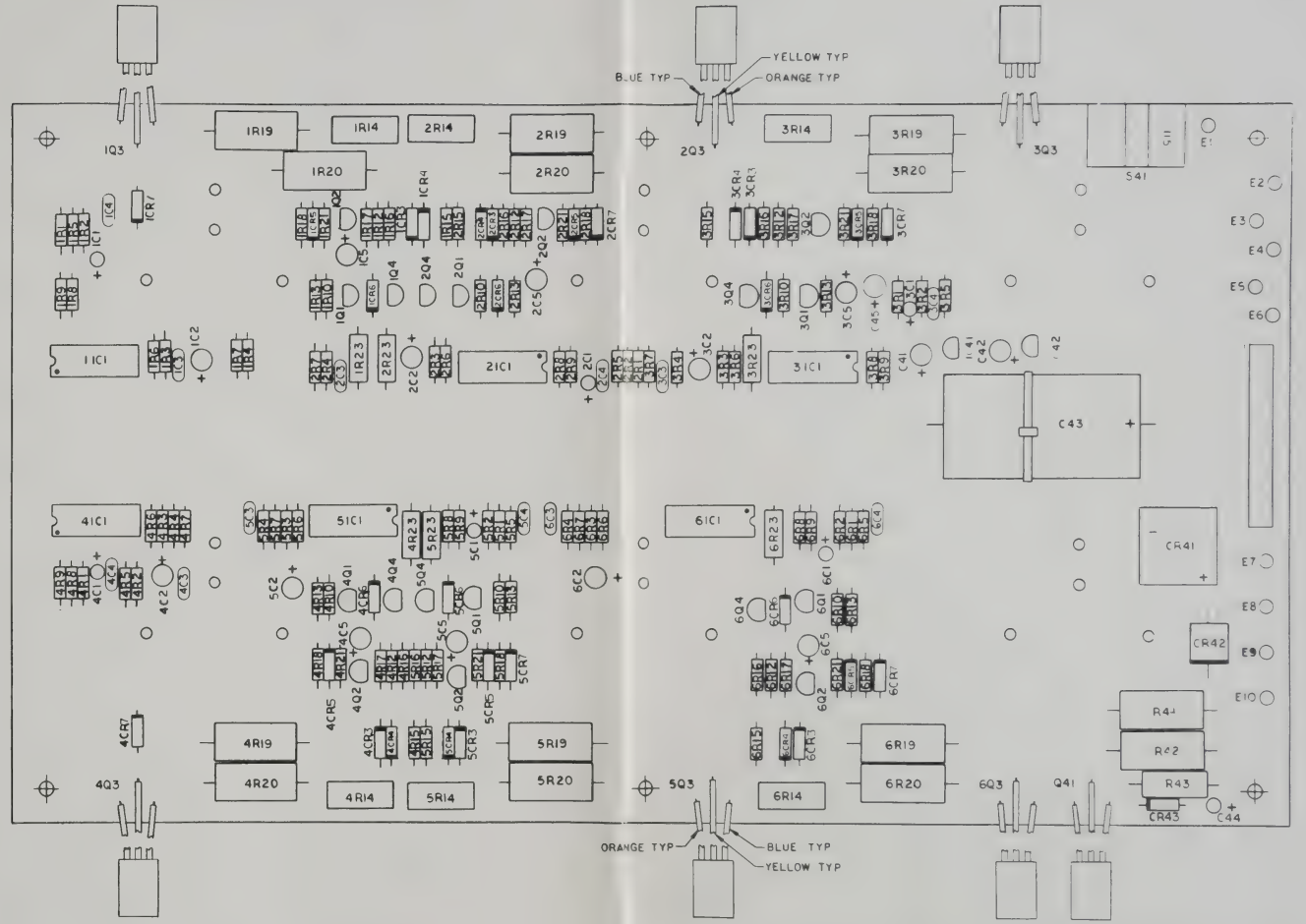
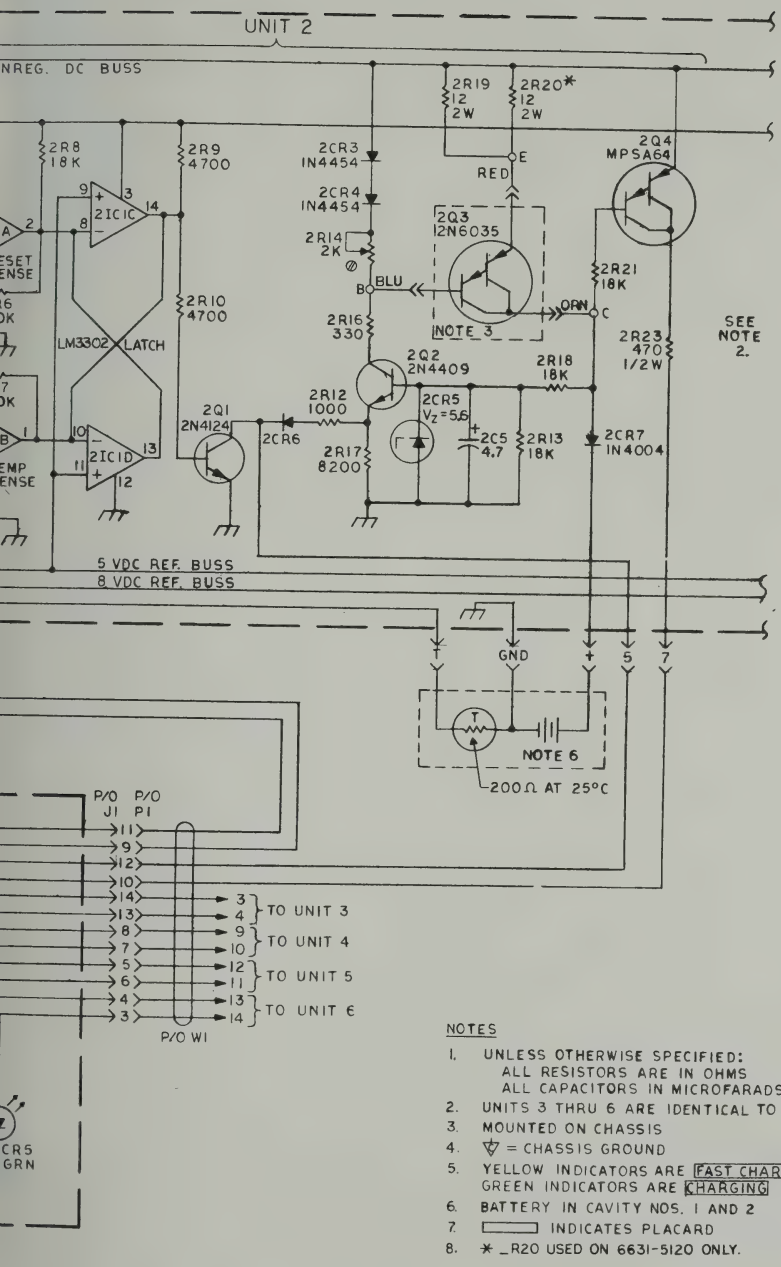


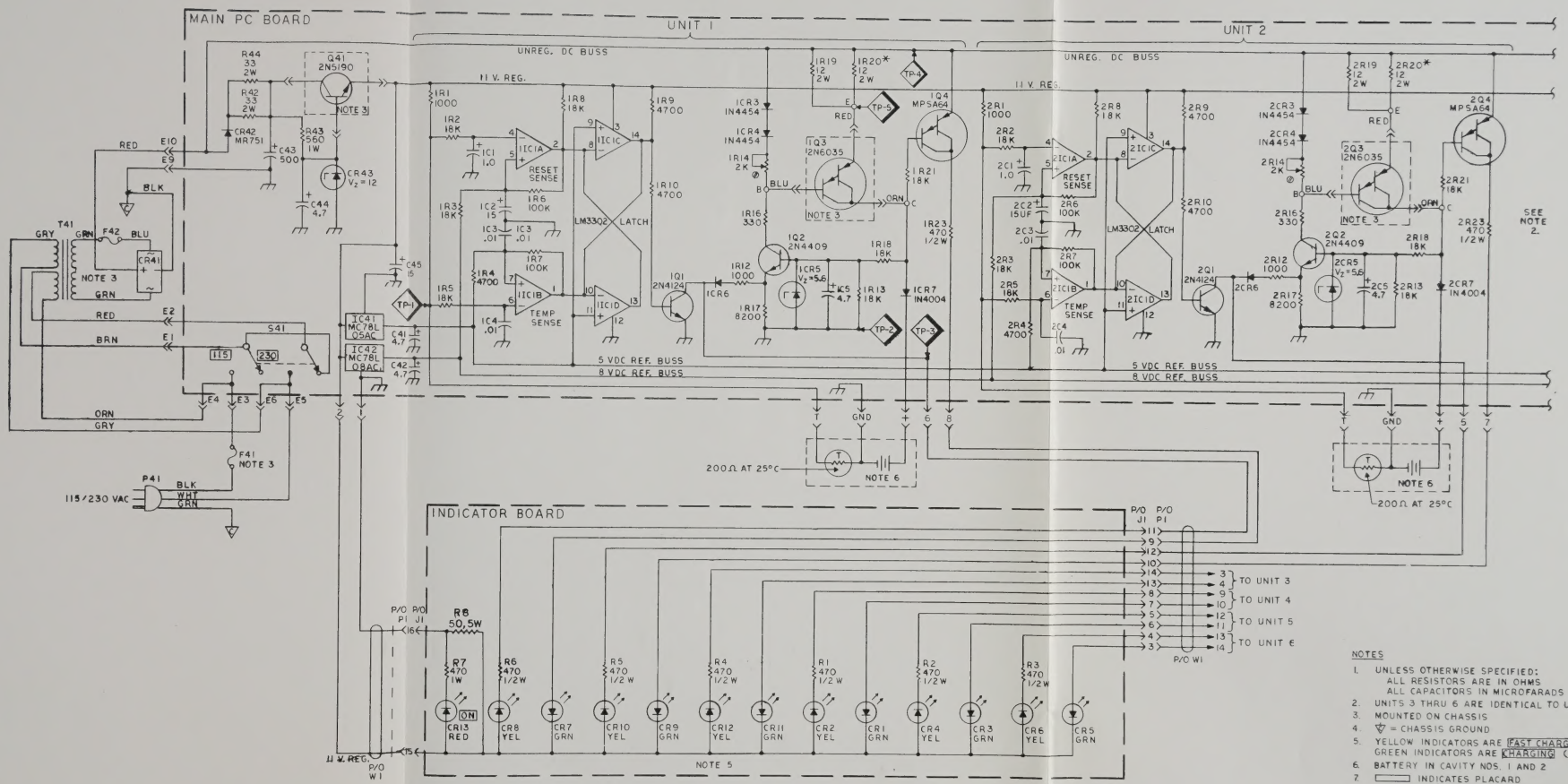
Figure 5-2. 6-Unit Series Charger Main PWB Assembly RF-7900-6F and RF-7901-6F



NOTES

1. UNLESS OTHERWISE SPECIFIED:
   ALL RESISTORS ARE IN OHMS
   ALL CAPACITORS IN MICROFARADS
2. UNITS 3 THRU 6 ARE IDENTICAL TO UNITS 1 & 2
3. MOUNTED ON CHASSIS
4. ⏚ = CHASSIS GROUND
5. YELLOW INDICATORS ARE FAST CHARGE (6 PLACES)
   GREEN INDICATORS ARE CHARGING (6 PLACES)
6. BATTERY IN CAVITY NOS. 1 AND 2
7. ▭ INDICATES PLACARD
8. * _R20 USED ON 6631-5120 ONLY.

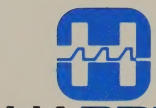
Figure 5-3. 6-Unit Series Charger Schematic RF-7900-6F and RF-7901-6F



NOTES

1. UNLESS OTHERWISE SPECIFIED:
   ALL RESISTORS ARE IN OHMS
   ALL CAPACITORS IN MICROFARADS
2. UNITS 3 THRU 6 ARE IDENTICAL TO UNITS 1 & 2
3. MOUNTED ON CHASSIS
4. ⏚ = CHASSIS GROUND
5. YELLOW INDICATORS ARE FAST CHARGE (6 PLACES)
   GREEN INDICATORS ARE CHARGING (6 PLACES)
6. BATTERY IN CAVITY NOS. 1 AND 2
7. ▭ INDICATES PLACARD
8. * - R20 USED ON 6631-5120 ONLY.

Figure 5-3. 6-Unit Series Charger Schematic RF-7900-6F and RF-7901-6F



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